REMARKS

In response to the Office Action mailed January 27, 2003, applicants respectfully request reconsideration of the present application.

Claims 1, 16 and 22 stand rejected under 35 U.S.C. §102(b), as being anticipated by Quarles, U.S. Patent 1,711,653 ("Quarles"). Claims 18-21 stand rejected under 35 U.S.C. §102(e) as being anticipated by Tambe, et al., U.S. Patent Application Publication 2002/0113649 A1 ("Tambe"). Claims 2, 3, 5 and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Quarles in view of Federal Telephone and Radio Corporation (Reference Data for Engineers). Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Quarles in view of Baker (The Challenges of Implementing). Claims 6-8, 10, 23 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art. Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art as applied to Claim 6, and further in view of Baker. Claim 17 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Quarles in view of Vittore (Making DSL go for the Long Run). Claims 11 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore. Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore as applied to Claim 11 and further in view of Quarles.

Claims 1-25 remain pending in the application. No claims have been cancelled. Claims 1-3, 6-8, 10, 11, 14-18 and 22-25 have been amended. No claims have been added. It is respectfully submitted that the amendments do not add new matter.

Also attached to the present response is a Power of Attorney By Assignee and Revocation of Previous Powers document. Applicants submit a Request for Continuing Examination.

Rejections Under 35 U.S.C. §102

Quarles

The Examiner has rejected claims 1, 16 and 22 under 35 U.S.C. §102(b), as being anticipated by Quarles, U.S. Patent 1,711,653 ("Quarles"). The Examiner has stated that:

> Quarles discloses a load coil comprising a coupled inductor with two windings wrapped about an inductor core with capacitors connected diagonally across the windings (Fig. 1 and page 1, lines 99-102). Claim 1 contains language indicating the inductor is configured to counteract capacitance across the loop to improve transmission of POTS-based signals and that the capacitive elements are configured to permit passage of DSL signals. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham, 2 USPQ2d* 1647 (Bd. Pat. App. & Inter. 1987). Because the load coil disclosed by Quarles is structurally identical to the load coil of Claim 1, the recitation related to use carries no weight. Claim 1 contains language indicating the capacitances of the capacitive elements are selected based upon an inter-winding capacitance between the first winding and the second winding. The method by which the capacitances are determined does not affect patentability. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though

the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964,966 (Fed. Cir. 1985). Therefore, Claim 1 is unpatentable over Quarles. (Office Action of 1/27/2003, p. 2-3).

However, Applicants respectfully submit that the present claims are not anticipated by Quarles. Claim 1, as amended, recites:

> A load coil for insertion along a local loop, the load coil comprising:
> a coupled inductor having first and second windings wrapped about an inductor core, each winding having an input and an output, the coupled inductor configured to counteract a parallel capacitance of the local loop to improve transmission of POTS-band signals across the local loop, wherein the first and second windings have an inter-winding capacitance value between them;
> a first capacitive element disposed between the input of the first winding and the input of the second winding; and
> a second capacitive element disposed between the output of the first winding and the output of the second winding, wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding to permit passage of DSL signals across the load coil. (Claim 1, emphasis added).

In contrast, Quarles discloses that capacitive values for the two condensers 8 are based upon a total capacitance value measured between the wires comprising each section of line (Quarles, Fig. 1, 6) to contribute to the effective inductance of the loading unit 5 (Quarles, Claim 3). Quarles discloses, in claim 3:

> A two-wire transmission line comprising a plurality of equal sections divided by inductive loading units, said units comprising an inductance having equal windings in series with the wires of said transmission line, and a capacity [condenser] effectively connected between the midpoints of said windings, said capacity [condenser] having a value [capacitance value] between .4 and .8 of the total capacity [capacitance value] between the wires of one of said sections. (Quarles, Claim 3, emphasis added, additions in brackets).

The condenser connected between the midpoints of the windings disclosed by Quarles is significant to Quarles' system, since the capacitance value of the condenser

contributes to the variable effective inductance of the loading unit 5. For example, Quarles discloses that the effective inductance of a network equivalent (FIG. 3) of the loading unit 5 is $L_e = L/(1 + 1/(2p^2LC))$, where C is a capacitance of the condenser 8, L is an inductance of the inductance coil 7, and p is the angular velocity (page 2, lines 96-102, and Equation (1)). Since Quarles' system is designed to use the variable effective inductance of the loading unit 5 to correct for transient distortion of POTS signals over each section of line 6, which depends upon lengths of each section of line 6, it is not surprising that Quarles chooses capacitive values for condensers 8 based upon the total capacitance measured between the wires comprising each section of line 6, and thus the capacitive values for condensers 8 depend upon a length of each section of line 6. In fact, the Examiner acknowledges that Quarles teaches capacitive values for the condensers 8 based upon "the capacitance of a loop section," (Office Action of 9/4/2002, paragraph 12, lines 7-8).

Quarles does not disclose or suggest "capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding to permit passage of DSL signals across the load coil," so that the attenuation of higher frequency signals, such as DSL signals, are able to pass without significant attenuation. In fact, Quarles does not disclose or suggest that the capacitive values of condensers 8 are selected based upon any capacitance associated with the inductance coils 7. Therefore, Quarles does not disclose or suggest "the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding," as recited in claim 1, as amended.

The Examiner stated that

> a claim containing a 'recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus' if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham, 2 USPQ2d* 1647 (Bd. Pat. App. & Inter. 1987). Because the load coil disclosed by Quarles is structurally identical to the load coil of Claim 1, the recitation related to use carries no weight." (Office Action of 1/27/2003, p. 2-3).

Applicants respectfully submit that *Ex parte Masham* states that "a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of that claimed." Applicants respectfully submit that the limitation of "the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value," recited in claim 1, is neither a "recitation with respect to the material intended to be worked upon", nor is it a "recitation with respect to the manner in which a claimed apparatus is intended to be employed", nor is it a "recitation related to use"; rather, it is a relationship between two structural limitations, which differentiates the claim over Quarles.

Furthermore, MPEP 2131.03 states that "prior art which teaches a range within, overlapping, or touching the claimed range anticipates if the prior art range discloses the claimed range with "sufficient specificity." Claim 1 recites that "the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding." Applicants respectfully submit that Quarles is silent as to whether any

relationship exists between the capacitance values and an inter-winding capacitance value. Quarles does not disclose that a relationship exists between those two structural elements. Thus, Quarles has not disclosed a range with sufficient specificity to anticipate claim 1. Furthermore, per MPEP 2131, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (MPEP 2131, citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). Applicants respectfully submit that Quarles does not disclose each and every element of claim 1.

The Examiner also stated that "the method by which the capacitances are determined does not affect patentability." (Office Action of 1/27/2003, p. 3) Applicants respectfully submit that the limitation of "the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value," recited in claim 1, as amended, does not recite a method by which the capacitances are determined. Rather, the limitation describes a relationship of the values associated with the structural elements. Therefore, Applicants respectfully submit that the limitation must be considered in determining patentability.

Furthermore, Quarles also does not disclose or suggest, and further teaches away from improving the transmission of POTS-band signals across the local loop. Quarles states that "the attenuation of a line loaded in accordance with the invention is increased by the addition of the loading unit capacities." (Quarles, page 4, lines 43-45). Quarles discloses that the increased value of the total effective capacity is $(1 + r)^{1/2}$, where r is the ratio of the capacity of the loading unit to the line capacity (Quarles, page

3, lines 25-29). In other words, Quarles' system is configured to address transient signal distortion at the expense of signal attenuation. Thus, Quarles does not disclose or suggest, and further teaches away from a "coupled inductor configured to counteract a parallel capacitance of the local loop to improve transmission of POTS-band signals across the local loop," as recited in claim 1.

Additionally, Quarles does not disclose or suggest that the capacitive values of condensers 8 to permit passage of DSL signals across the load coil. In fact, Quarles does not disclose any capacitive values of condensers 8, but rather only that they depend upon the length of each section of line 6. Applicants respectfully submit that Quarles' system is designed to use the variable effective inductance of the loading unit 5 to correct for transient distortion of POTS signals over each section of line 6. Thus, Quarles does not disclose or suggest that "the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding to permit passage of DSL signals across the load coil," as recited in claim 1, as amended.

Claim 16, as amended, recites "capacitive means having a capacitance value that is at least four times a capacitance value of the inductive means." As discussed above with respect to claim 1, Quarles does not disclose or suggest capacitive means having a capacitance value relative to a capacitance value of the inductive means. Accordingly, claim 16 is not anticipated by Quarles, for at least the reasons discussed above with respect to claim 1.

Claim 22, as amended recites "wherein the first capacitor and the second capacitor have capacitance values that are at least four times an inter-winding

capacitance value between the first inductor winding and the second inductor winding." As discussed above, Quarles does not disclose or suggest wherein the first capacitor and the second capacitor have capacitance values that are at least four times an inter-winding capacitance value between the first inductor winding and the second inductor winding. Accordingly, claim 22 is not anticipated by Quarles for at least the reasons discussed above with respect to claim 1.

Tambe

Claims 18-21 stand rejected under 35 U.S.C. §102(e) as being anticipated by Tambe, et al., U.S. Patent Application Publication 2002/0113649 A1 ("Tambe"). The Examiner has stated that:

> Claim 18 further claims the capacitances of the capacitive elements are selected based upon a capacitance of the coupled inductor. Tambe further discloses selecting capacitance by collecting frequency response data for the modified load coil by sweeping the value of the capacitance across a range. Because the capacitance of the coupled inductor is included in the modified load coil during this procedure, its capacitances influences the result, and the capacitances of the capacitors is inherently based on the capacitance of the coupled inductor. (Office Action of 1/27/2003, p. 5).

However, Applicants respectfully submit that the present claims are not anticipated by Tambe. Claim 18 recites:

> A method for improving simultaneous transmission of POTS-band signals and DSL signals across a local loop, comprising the steps of:
>
> inductively coupling a first segment of the local loop to a second segment of the local loop via a coupled inductor to condition the POTS-band signals traversing the local loop; and
>
> capacitively coupling the first segment of the local loop to the second segment of the local loop via capacitive elements to pass the DSL signals traversing the local loop with low attenuation, the capacitive elements having capacitance values that are selected based upon a capacitance value of the coupled inductor. (Claim 18, emphasis added).

In contrast, Tambe discloses that "embodiments of the invention can be identified one at a time by selecting a value for R or C and then collecting frequency response data while the other variable (C or R) is swept across a range." (Tambe, [0062]). Thus, Tambe discloses selecting a value for C by sweeping the value of R across a range. In other words, Tambe discloses selecting a capacitance value based upon sweeping a resistance value across a range.

Applicants respectfully submit that Tambe does not disclose or suggest "having capacitance values that are selected based upon a capacitance value of the coupled inductor," as recited in claim 18. Instead, Tambe explicitly discloses that a capacitance value is selected based upon sweeping a resistance value across a range. Additionally, by teaching that a value for C is selected by sweeping the value of R across a range, Tambe teaches away from "capacitance values that are selected based upon a capacitance value of the coupled inductor."

Accordingly, Tambe does not anticipate claim 18. Since claims 19-21 depend from claim 18 and include its limitations, claims 19-21 are also not anticipated by Tambe.

Applicants reserve the right to challenge the use of Tambe as prior art under 35 U.S.C. §102(e) based on its file date being later than the file date of this patent application and only its provisional date being early than the tile date of this patent application. Under 37 CFR 1.131, applicants also reserve the right to swear behind Tambe due to its provisional file date being less than a year prior to this applications file date.

Rejections under 35 U.S.C. §103(a)

Quarles in view of Federal Telephone and Radio Corporation

Claims 2, 3, 5 and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Federal Telephone and Radio Corporation (Reference Data for Engineers). The Examiner has stated that:

> Claim 2 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 1, Quarles discloses all relevant elements of that claim. Therefore, Quarles discloses all relevant elements of Claim 2 with the exception of explicit numerical specification of the capacitance values. Quarles specifies the value of the capacitors as being half of the value to be used between the middle points of the loading coils (page 4, lines 58-64) which is specified to be between.4 and.8 of the total between the wires of one section of the loop. Quarles therefore teaches a value of the capacitors between .2 and.4 of the capacitance of a loop section. Federal Telephone and Radio Corporation teaches that the capacitance of a mile of 24 AWG telephone transmission line is .075 μF (page 111). A 6,000 foot loop section, therefore, has a capacitance of .075(6000/5280) μF which is equal to .085 μF or 85 nF. Hence, the values Quarles teaches are between .2(85)nF and .4(85) nF, that is, between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.
>
> Claim 3 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 1, Quarles discloses all relevant elements of that claim. Therefore, Quarles discloses all relevant elements of Claim 3 with the exception of explicit numerical specification of the capacitance values. As stated above apropos of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values of between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.
>
> Claim 5 claims the load coil of Claim 1 wherein the capacitive elements increase the effective interwinding capacitance of the inductor windings by at least a factor of 5. As stated above apropos of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values between 17

nF and 34 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective interwinding capacitance by a factor of five to ten (page 13, lines 15-18). Therefore, it is inherent in the values taught by Quarles and Federal Telephone and Radio Corporation that they increase the effective interwinding capacitance of the inductor windings by at least a factor of 5.

Claim 24 is essentially similar to Claim 5 and is rejected for the reasons stated above apropos of Claim 5. (Office Action of 1/27/2003, pages 7-8).

However, Applicants respectfully submit that the present claims are patentable over Quarles in view of Federal Telephone and Radio Corporation. Claim 1, as amended, recites "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding." As discussed above, Quarles does not disclose or suggest the limitations stated in claim 1, as amended.

Furthermore, Federal Telephone and Radio Corporation does not disclose or suggest "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding."

Applicants respectfully submit that even if the Quarles and Federal Telephone and Radio Corporation were combined, such a combination would lack "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding," as recited in claim 1.

Furthermore, as discussed above, Quarles discloses capacitive values for condensers 8 based upon the total capacitance measured between the wires

comprising each section of line 6, and thus the capacitive values for condensers 8 depend upon a length of each section of line 6. However, Quarles does not disclose or suggest a specific capacitance for condensers 8. Additionally, Quarles does not disclose or suggest a specific length of line for which the capacitive values for condensers 8 may be based upon. Federal Telephone and Radio Corporation only discloses reference data, and also does not teach or suggest a specific capacitive value for the condensers 8.

Accordingly, claim 1 is not rendered obvious by Quarles in view of Federal Telephone and Radio Corporation. Since claims 2, 3, 5 and 24 depend from claim 1 and include its limitations, claims 2, 3, 5 and 24 are also not rendered obvious by Quarles in view of Federal Telephone and Radio, for at least the reasons stated above.

Quarles in view of Baker

Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Quarles in view of Baker (The Challenges of Implementing). The Examiner stated that:

> Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading). It would have been obvious to one skilled in the art at the time of the invention to use a load coil with a common inductance value in the system disclosed by Quarles for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations. (Office Action of 1/27/2003, page 9).

However, Applicants respectfully submit that the present claims are patentable over Quarles in view of Baker. Claim 1, as amended, recites "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding

and the second winding." As discussed above, Quarles does not disclose or suggest the limitations stated in claim 1, as amended.

Furthermore, Baker does not disclose or suggest "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding."

Applicants respectfully submit that even if the Quarles and Baker were combined, such a combination would lack "wherein the first capacitive element and the second capacitive element each have capacitance values that are at least four times the inter-winding capacitance value between the first winding and the second winding," as recited in claim 1.

Additionally, Baker teaches away from "a load coil for insertion along a local loop," as recited in claim 1. Baker discloses:

> Unfortunately, loaded analog systems and digital systems are not compatible. You cannot pass digital and high-frequency signals through the coils. During deployment of digital services, remember that any load coils are unacceptable.
>
> To remove load coils, first use a load coil counter to determine approximately how many loads there are on the line. (Baker, page 2).

Thus, a person skilled in the art would not be motivated to combine the Baker with Quarles, since Baker teaches away from the use of load coils, by explicitly stating that "any load coils are unacceptable."

Accordingly, claim 1 is not rendered obvious by Quarles in view of Baker. Since claim 4 depends from claim 1 and include its limitations, claim 4 is also not rendered obvious by Quarles in view of Baker, for at least the reasons stated above.

Pupin in view of Birck and further in view of well known prior art

Claims 6-8, 10, 23 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art. The Examiner stated that:

> Pupin discloses a load coil comprising a coupled inductor (Fig. 3 and page 3, lines 39-41 and 50-53) configured to improve transmission of telephone signals (page 1, lines 17-19). Therefore, Pupin teaches all elements of Claim 6 with the exception of the capacitor in parallel with each winding to permit passage of DSL signals across the coil with low attenuation. Birck teaches the use of frequency selective elements to allow higher frequency signals to pass across loading coils (Fig. 1 C and column 3 line 39 through column 4, line 8). It would have been obvious to one skilled in the art to apply the bypass by a frequency selective element as taught by Birck to the load coil taught by Pupin for the purpose of allowing higher frequency signals to be carried on the loaded line. Therefore, the combination of Pupin and Birck teaches all elements of Claim 6 with the exception of the use of capacitors as the frequency selective element. Examiner takes official notice that it was well known in the art that a capacitor provides a low impedance path for high frequency signals. It would have been obvious to one skilled in the art at the time of the invention to apply the use of capacitors as was well known in the art to the combination of Pupin and Birck for the purpose of providing the frequency selective device. Claim 6 contains language indicating the capacitances of the capacitive elements are selected based upon an intrawinding capacitance of an inductor winding. As stated above apropos of Claim 1, the method by which the capacitances are determined does not affect patentability. (Office Action of 1/27/2003, pages 9-10).

However, Applicants respectfully submit that the present claims are patentable over Pupin in view of Birck and further in view of well known prior art.

Claim 6, as amended, recites:

> A load coil for insertion along a local loop, the load coil comprising:
>
> a coupled inductor having first and second windings wrapped about an inductor core, each winding having an input and an output, the coupled inductor configured to improve transmission of POTS-band signals across the local loop;
>
> a first capacitive element disposed in parallel with the first winding; and

> a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil. (Claim 6, emphasis added).

Applicants respectfully submit that Pupin does not disclose or suggest "a first capacitive element disposed in parallel with the first winding; and a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil." As acknowledged by the Examiner, Pupin does not teach "the capacitor in parallel with each winding to permit passage of DSL signals across the coil with low attenuation."

Applicants respectfully submit that Birck also does not disclose or suggest, and in fact, teaches away from "a first capacitive element disposed in parallel with the first winding; and a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil." Instead, Birck discloses that:

> A frequency selective device 39 is connected in shunt of the loading coil. This frequency selective device, which may be a high-pass filter of conventional structure serves to by-pass any alternating currents whose frequencies exceed 100 kilohertz. (Birck, col. 3, ln. 73- col. 4, ln. 3).

Thus, Birck discloses that the frequency selective device is a high-pass filter that by-passes frequencies over 100kHz. Since ADSL upstream signals generally occupy the

frequency spectrum between about 26 – 120 KHz, the frequency selective device disclosed by Birck would not "permit passage of DSL signals across the load coil," as recited in claim 6. In fact, the frequency selective device disclosed by Birck would by significantly attenuate a large portion of the frequency spectrum occupied by ADSL upstream signals. Therefore, Birck does not disclose or suggest the limitations of claim 6.

It is also respectfully submitted that Pupin does not suggest a combination with Birck, and Birck does not suggest a combination with Pupin since Birck specifically teaches away from such a combination. It would be impermissible hindsight to combine Pupin with Birck based on Applicants' own disclosure.

Applicants respectfully submit that even if Pupin, Birck, and Examiner's asserted well known prior art were combined, such a combination would lack "a first capacitive element disposed in parallel with the first winding; and a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil," as recited in claim 6.

Accordingly, claim 6 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art. Since claims 7, 8, 10 and 25 depend from claim 6 and include its limitations, claims 7, 8, 10 and 25 are also not rendered obvious by Pupin in view of Birck and further in view of well known prior art.

Claim 23, as amended, includes the limitations of:

capacitive elements configured to pass the DSL signals traversing the first and second local loops, the capacitive elements including
a first capacitor coupling the first wire to the third wire, and
a second capacitor coupling the second wire to the fourth wire, wherein the first capacitor and the second capacitor have capacitance values relative to an intra-winding capacitance value of either the first inductor winding or the second inductor winding. (Claim 23, emphasis added).

As discussed above, Pupin does not disclose or suggest "capacitive elements configured to pass the DSL signals traversing the first and second local loops," as recited in claim 23. As discussed above, Birck also does not disclose or suggest "capacitive elements configured to pass the DSL signals traversing the first and second local loops," as recited in claim 23. Furthermore, Birck does not disclose or suggest "wherein the first capacitor and the second capacitor have capacitance values relative to an intra-winding capacitance value of either the first inductor winding or the second inductor winding," as recited in claim 23. Still further, the Examiner's asserted well known prior art does not disclose or suggest the limitations of claim 23, as discussed above. Accordingly, it is respectfully submitted that claim 23 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art.

Pupin in view of Birck and further in view of well known prior art and further in view of Baker

Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art as applied to Claim 6, and further in view of Baker. The Examiner stated that:

> Claim 9 claims the load coil of Claim 6 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art discloses all the elements of that claim. Therefore, the combination discloses all the elements of Claim 9 with

the exception of specification of the inductance value. Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading). It would have been obvious to one skilled in the art at the time of the invention to apply the common inductance value of 66 mH to the combination taught by Pupin, Birck and well known prior art for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations. (Office Action of 1/27/2003, p.12).

However, Applicants respectfully submit that claim 9 is patentable over Pupin in view of Birck and further in view of well known prior art as applied to Claim 6, and further in view of Baker.

Claim 6, as amended, recites:

> A load coil for insertion along a local loop, the load coil comprising:
> a coupled inductor having first and second windings wrapped about an inductor core, each winding having an input and an output, the coupled inductor configured to improve transmission of POTS-band signals across the local loop;
> a first capacitive element disposed in parallel with the first winding; and
> a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil. (Claim 6, emphasis added).

Applicants respectfully submit that claim 6 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art, and further in view of Baker.

As discussed above, claim 6 is not rendered obvious by Pupin in view of Birck and further in view of the Examiner's asserted well known prior art.

Applicants respectfully submit that Birck also does not disclose or suggest "a first capacitive element disposed in parallel with the first winding; and a second capacitive element disposed in parallel with the second winding, wherein the first capacitive element and the second capacitive element have capacitance values relative to an

intra-winding capacitance value of either the first winding or the second winding to permit passage of DSL signals across the load coil," as recited in claim 6.

Furthermore, as discussed above, Baker teaches away from "a load coil for insertion along a local loop," as recited in claim 6. Thus, a person skilled in the art would not be motivated to combine the Baker with Pupin in view of Birck and further in view of well known prior art as applied to Claim 6, since Baker teaches away from the use of any load coils, by explicitly stating that "any load coils are unacceptable."

Accordingly, claim 6 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Baker. Since claim 9 depends from claim 6 and include its limitations, claim 9 is also not rendered obvious by Pupin in view of Birck and further in view of well known prior art as applied to Claim 6, and further in view of Baker.

Quarles in view of Vittore

Claim 17 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Quarles in view of Vittore (Making DSL go for the Long Run). The Examiner stated that:

> Claim 17 claims a system for transmitting DSL and POTS signals comprising a load coil means including inductive means and capacitive means for improving DSL transmission across the load coil and DSL amplification means to amplify DSL signals. As stated above apropos of Claim 1, Quarles teaches all the elements of the load coil means. Therefore, Quarles teaches all elements of Claim 17 with the exception of DSL amplification means. Vittore discloses a DSL repeater that amplifies DSL signals (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the DSL amplifier disclosed by Vittore on a loop in addition to the load coil system taught by Quarles for the purpose of providing DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3). Claim 17 contains language indicating the capacitances of the capacitive means are based upon a capacitance of the inductive means. As stated above apropos of Claim 1, the

method by which the capacitances are determined does not affect patentability. (Office Action of 1/27/2003, p.13).

However, Applicants respectfully submit that claim 17 is patentable over Quarles in view of Vittore. Claim 17, as amended, recites:

> A system for transmitting DSL and POTS signals over a local loop, the system comprising:
> load coil means positioned along the local loop, the load coil means comprising inductive means for conditioning POTS signals as they traverse the local loop and capacitive means having capacitance values relative to a capacitance value of the inductive means coupled to the inductive means for facilitating passage of DSL signals across the load coil; and
> DSL signal amplification means positioned along the local loop for amplifying DSL signals as they traverse the local loop. (Claim 17, emphasis added).

Applicants respectfully submit that the limitation of "capacitive means having capacitance values relative to a capacitance value of the inductive means," recited in claim 17, as amended, does not recite a method by which the capacitances are determined. Therefore, Applicants respectfully submit that the limitation must be considered in determining patentability. As discussed above, Quarles does not disclose or suggest "capacitive means having capacitance values relative to a capacitance value of the inductive means."

Furthermore, Applicants respectfully submit that Vittore also does not disclose or suggest "capacitive means having capacitance values relative to a capacitance value of the inductive means coupled to the inductive means for facilitating passage of DSL signals across the load coil." Accordingly, it is respectfully submitted that claim 17 is not rendered unpatentable by Quarles in view of Vittore.

Pupin in view of Birck and further in view of well known prior art and further in view of Vittore

Claims 11 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore. The Examiner stated that:

> Claim 11 claims a system for transmitting DSL and POTS signals comprising a load coil including a coupled inductor and multiple capacitive elements for improving DSL transmission across the coil and a repeater which includes another load coil in series with the load coil to amplify DSL signals. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art teaches all the elements of the first load coil. Vittore discloses a DSL repeater that is selective of DSL signals and amplifies only them (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective DSL amplifier disclosed by Vittore in the combination of Pupin, Birck and well known prior art for the purpose of providing the frequency selective element disclosed by Birck. Further, it would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective amplifier and load coil combination on a loop in addition to the capacitor and load coil combination for the purpose of providing DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3). Claim 11 contains language indicating the capacitances of the capacitive elements are selected based upon a capacitance of the coupled inductor. As stated above apropos of Claim 1, the method by which the capacitances are determined does not affect Patentability. (Office Action of 1/27/2003, p.13-14).

However, Applicants respectfully submit that the present claims are patentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore.

Claim 11, as amended, recites:

> A system for transmitting DSL and POTS signals over a local loop, the system comprising:
>
> a first load coil for disposal along the local loop to condition the POTS signals, the first load coil including a coupled inductor and multiple capacitive elements for increasing an effective capacitance of the coupled inductor, wherein the multiple capacitive elements have <u>capacitance values relative to a capacitance value of the coupled inductor</u> to improve transmission of DSL signals across the first load coil; and

> a first DSL signal repeater for disposal along the local loop in series with the first load coil to amplify the DSL signals, the first DSL signal repeater including a second load coil for conditioning POTS signals passing therethrough. (Claim 11, emphasis added).

Applicants respectfully submit that the limitation of "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor," recited in claim 11, as amended, does not recite a method by which the capacitances are determined. Therefore, Applicants respectfully submit that the limitation must be considered in determining patentability.

As discussed above, Pupin does not disclose or suggest "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor." Furthermore, Applicants respectfully submit that, as discussed above, Birck also does not disclose or suggest "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor." Additionally, as discussed above, neither the Examiner's asserted well known prior art, nor Vittore disclose or suggest "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor," as recited in claim 11.

Accordingly, it is respectfully submitted that claim 11 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore. Since claims 13-15 depend from claim 11 and include its limitations, claims 13-15 are also not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore.

Pupin in view of Birck and further in view of well known prior art and further in view of Vittore and further in view of Quarles

Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore as applied to Claim 11 and further in view of Quarles. The Examiner stated that:

> Claim 12 claims the system of Claim 11 with first and seconds windings capacitive elements disposed diagonally across those windings. As stated above apropos of Claim 11, the combination of Pupin, Birck, well known prior art and Vittore meet all elements of that claim. Therefore, the combination has all the elements of Claim 12 with the exception of the diagonal disposal of the capacitive elements. As stated above apropos of Claim 1, Quarles teaches diagonal disposal of capacitors in a loading coil. It would have been obvious to one skilled in the art at the time of the invention to apply the diagonal disposal of capacitors taught by Quarles to the combination for the purpose of reducing transient distortion. (Office Action of 1/27/2003, p.15)

However, Applicants respectfully submit that claim 12 is patentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore as applied to Claim 11 and further in view of Quarles.

Claim 11, as amended, recites:

> A system for transmitting DSL and POTS signals over a local loop, the system comprising:
>
> a first load coil for disposal along the local loop to condition the POTS signals, the first load coil including a coupled inductor and multiple capacitive elements for increasing an effective capacitance of the coupled inductor, wherein the multiple capacitive elements have <u>capacitance values relative to a capacitance value of the coupled inductor</u> to improve transmission of DSL signals across the first load coil; and
>
> a first DSL signal repeater for disposal along the local loop in series with the first load coil to amplify the DSL signals, the first DSL signal repeater including a second load coil for conditioning POTS signals passing therethrough. (Claim 11, emphasis added).

Applicants respectfully submit that claim 11 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore and further in view of Quarles.

As discussed above, claim 11 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore.

Furthermore, as discussed above, Quarles does not teach or suggest "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor," as recited in claim 11.

Thus, Applicants respectfully submit that even if Pupin, Birck, the Examiner's asserted well known prior art, Vittore and Quarles were combined, such a combination would lack "wherein the multiple capacitive elements have capacitance values relative to a capacitance value of the coupled inductor," as recited in claim 11.

Accordingly, claim 11 is not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore and further in view of Quarles. Since claim 12 depends from claim 11 and includes its limitations, claim 12 is also not rendered obvious by Pupin in view of Birck and further in view of well known prior art and further in view of Vittore and further in view of Quarles.

Conclusion

Applicants respectfully submit that in view of the amendments and discussion set forth herein, the applicable rejections have been overcome and the pending claims are in condition for allowance.

If the Examiner finds any remaining impediment to the prompt allowance of the claims that could be clarified with a telephone conference, the Examiner is respectfully requested to contact Thomas Ferrill at (408) 720-8300.

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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